International Economics

Lecture 03

The Ricardian Model of Comparative Advantages

Introducing the theoretical framework

Is International trade a win-win situation?

- The modern theory of International Trade was born with Ricardo (1817)
- *Traditional theories* explain inter-sector trade between different countries (e.g. North-South): three steps
  - Classical Ricardo model (comparative advantages);
  - Neoclassical Hecksher-Ohlin-Samuelson model;
  - The standard theory model.
    - Main assumptions: perfect competition and constant returns to scale
- *New theories* explain intra-sector trade between similar countries (i.e. North-North): second wave of globalization.
    - Main assumptions: imperfect competition and economies of scale (increasing returns to scale)

A few important definitions

- **Relative price**: price of a good in terms of the price of another good

  $P_1 = 30$; $P_2 = 10$; $P_1 / P_2 = 3$ (meaning?)

- It is the number of units of an alternative good that we have to restrain from buying in order to buy one unit of the good.
- **Opportunity cost of a good**: number of units of an alternative good that we have to give up in order to produce one unit of the good
- **Domestic terms of trade**: the relative price between goods in autarky (a closed economy)
- **International terms of trade**: the relative price between goods in international trade (an open economy)
- **Autarky**: a condition where the country does not trade with other countries
- **Free trade**: a condition where there is free exchange of goods, services and factors of production

Absolute and comparative advantages

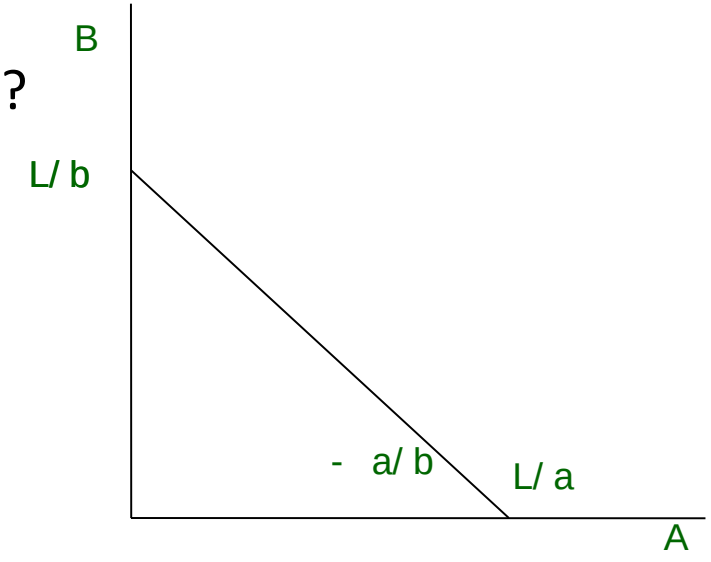
- **Absolute advantages: Built on the ideas of Adam Smith**
  - 1776, Wealth of Nations
- A country has an absolute advantage over another in a good if it can produce it more efficiently (i.e, if it uses less resources).
- **Comparative advantages: Built on the ideas of David Ricardo**
  - 1817, Principles of Politcal Economy
- A country has a comparative advantage over another in a good if its relative productivity is higher. In other words, if the opportunity cost of producing that good is lower.
- What is important for trade? Absolute or comparative advantages?
- Let's unfold a few cases

The Ricardian Model: assumptions

- We consider **two countries**: N and S
- We consider **two goods**: A (anchovies?) and B (bread?)
- We only have **one factor of production**: labour
  - This is a 2x2x1 model
- Very simple production factor with constant marginal productivity
  - $A = x_a L_A$, $Y = x_b L_B$
  - x_a, x_b, are technical coefficients: they measure how many goods are produced by one unit of L in each sector, respectively.
  - It is more useful to consider the inverse of labour productivity**, a, b, which measure the number of units of labour required to produce one unit of the good**
  - Hence, $A = L_A/a$, $Y = L_B/b$
  - L_A, L_B are the quantities of L used in the two sectors

The Ricardian Model: assumptions (2)

- Both productivities and quantities are generally different among countries
  - We do not waste resources and all labour is used for production:
  - $L = L_A + L_B$: Given the limited amount of resources, there is a limit in production, and a **trade-off** in what is possible to produce.
- This can be represented by the **Production Possibilities Frontier** (PPF)
- $B = L/b - (a/b)A$
- Does it remind you anything?



- In this simple economy the relative price is constant…
- and is equal to a/b

The Ricardian Model: relative prices

- In general, consider prices P_A and P_B
- The **hourly wage** in the two sectors will be $W_A = P_A/a$ and $W_B = P_B/b$ (since there are no other factors, hence profits are nil)

Workers will move in the sector where wages are higher (in sector A if $P_A/a > P_B/b$, that is, $P_A/P_B > a/b$)

- The economy will specialize in the production of the good where wages are higher.
- If the economy is competitive, $W_A = W_B$ and hence $P_A/a = P_B/b$ ($P_A/P_B = a/b$)
- Demand requires the economy to produce both goods
- **Simple labour theory of value: in absence of international trade, the relative price of goods is equal to their relative unit labour requirements**.

The Ricardian Model: the autarky intuition

- **Demand assumption**: A and B are consumed in a ratio of 1:1 (temp. hyp.)
- Two countries, N and S. Assume L=24 (number of hours in one day)
- a_N=1 (one unit of labour in N produces 1 unit of A). b_N=1/2
- Build the PPF: max production is 24A or 48B
- If the economy is competitive, production will be 16A and 16B (i.e. 16L fishing and 8L farming)
- a_S=5 (five units of labour in S produce 1 unit of A). b_S=1
- Build the PPF: max production is 4.8A or 24B
- If the economy is competitive, production will be 4A and 4B (20L fishing and 4L farming)
- This is a situation of **absolute advantages**: N is more efficient than S in both A ($a_N<a_S$) and B ($b_N<b_S$).

- In fact, **N is a richer economy** than S. World production is 20A and 20B

The Ricardian Model: the trade intuition

- Although N is more efficient than S, let's identify the sector in which it is relatively more efficient.
- Compare the relative labour productivity in both countries:
- a_N/b_N (= 2) < a_S/b_S (= 5)
- Ore, equivalently: a_N/a_S (= 1/5) < b_N/b_S (= ½)
- Meaning: the ratio of the labour required to produce one unit of A is lower in N than in S: in N the relative productivity of A is higher than B (**i.e., the opportunity cost of A is lower**).
  - **N has a comparative advantage in producing A**
  - On the opposite, S has a comparative advantage in producing B
- What if N specialises in A? A=24.
- What if S specialises in B? B=24
- First important result: World production is now higher **(trade is efficient)**

The Ricardian Model: international relative prices

- Prices of internationally traded goods are determined by supply and demand.
- We need a theory of international prices.
- However we know that **in autarky the relative price** of A is $a_N/b_N = 2$ in N and $a_S/b_S = 5$ in S
- As long as the international price is between $2<P^*<5$ there are mutual gains for both countries.
- If, for example **$P^*=3$**, we will end up with the following situation:
  - In N: $A^*=24-6=18$; $B^*=0+18=18$
  - In S: $A^*=0+6=18$; $B^*=24-18=6$
  - Since $A^*>A$ and $B^*>B$ for both countries N and S, **international trade is pareto superior than autarky**.
- More in general...

Determining the relative price after trade

- We need a general equilibrium approach (analyse A and B, N and S together)
- It is useful to consider the **relative supply and demand** (the number of A supplied or demanded divided by the number of B supplied or demanded)
- RD and RS in the figure
- No particular issue with RD. What about RS?
- If the relative P_A/P_B falls below a_N/b_N,

no production of A.

- If it is between a_N/b_N and a_S/b_S specializ.

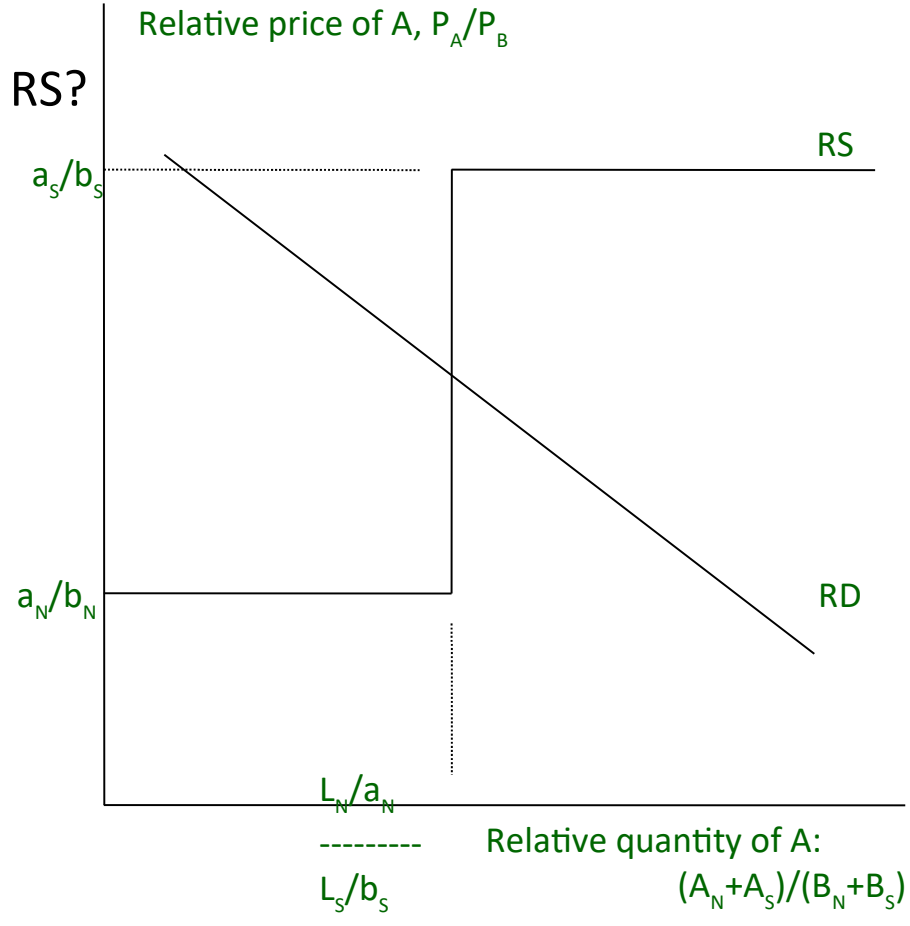
and exchange, as in the case before

- If the relative P_A/P_B goes over a_S/b_S,

no production of B

- This analysis overcomes the limits of

considering demand complementarity.



The gains from trade

- Trade is an indirect (more efficient) method of production:
- One unit of L_N could be used for producing $1/b_N$
- Alternatively, it could be used for producing $1/a_N$ and exchanged at the price P^*_A/P^*_B
- Hence, specialization and exchange is more efficient if $(1/a_N)\ (P^*_A/P^*_B) > 1/b_N$
- Which is: **$P^*_A/P^*_B > a_N/b_N$, exactly our initial condition**.
- Coherently, the PPF for both countries moves upward.
- **General conclusions**:
  - 1. An open economy is **more efficient** than autarky
  - 2. When two countries specialize and exchange goods for which they have a comparative advantage, **both countries gain from trade**.
  - 3. **Comparative**, not absolute advantages determine who will produce a good
  - 4. **Absolute** advantages determine wages and hence the level of wealth in the country

Misconceptions about comparative advantages

• **Productivity and competitiveness**: "International trade is benefitting only if the country is strong enough to stand up for foreign competition"

  – Wrong: gains depend on comparative, not absolute advantages.

• **The pauper labour argument**: "Fair competition is unfair and hurts other countries when it is based on low wages".

  – Wrong: The level of wages in the other country is irrelevant to the question whether our country gains from trade.

• **The unfair trade (exploitation):** "Trade exploits a country and makes it worse off if its workers receive much lower wages than workers in other nations"

  – Wrong: Look at the alternative of autarky, in which workers would have lower standard of living than in the condition of openness to international trade.

• Always remember to consider the assumptions of the model when discussing the policy implications.

Limitations and empirical evidence

- Limits of the model:
  - **Complete specialization**, which is unrealistic. Need to consider more than two goods, more than one factor of production, trade policies, costs of transport
  - Does not analyse how openness to trade **impacts on the domestic income distribution** (need more factors of production)
  - Does not analyse the **different stock of resources** in the different countries
  - Does not analyse the **impact of economies of scale**
- Need to move to more sophisticated models

- **Empirical evidence**: is the model a good proxy of the real world?
  - Yes, data show that countries tend to export those goods for which their productivity is relatively higher.